Pollution from optical cable production

Overview

Beyond sand, fiber optic production depends on energy-intensive processes to transform raw silica, metals, and petrochemicals into specialized glass cables. Globally, these greenhouse gas emissions approach 49 million tonnes per year – similar to seven average-sized coal power. Optical fiber networks form the backbone of our global communications infrastructure, carrying nearly 100% of transoceanic data traffic. As more cables stretch across seas and land to meet surging bandwidth demands, we must balance connectivity with conservation. Yet the environmental story does not end at installation: the full lifecycle—from raw material extraction and glass manufacturing to packaging. Over its entire life cycle, a fiber optic cable will consume fewer resources and generate less waste. Fiber optic networks offer long-term environmental benefits but face higher initial impacts compared to copper. In this white paper, we examine the key impacts across each life cycle phase.

Pollution from optical cable production

	Fiber-optic cables are thinner and lighter, requiring less material for manufacturing and less space for installation. This contributes to reduced transportation emissions during deployment.
	Copper mining is energy-intensive and often leads to water pollution and soil erosion, posing significant risks to ecosystems. Fiber optics, in contrast, are less toxic and require fewer ...
	Copper cables, both in production and disposal, generate significant waste. On the contrary, fiber optics and the work done by a fiber optic splicing contractor result in minimal waste, ...
	Industry studies confirm that contamination is the leading cause of fiber network failures. Without proper cleaning and inspection, performance rapidly degrades and permanent damage can occur.
	Fiber optic manufacturing is energy-intensive during the glass purification and drawing phases, but it has a smaller carbon footprint per unit than copper. Modern manufacturers are investing in cleaner ...

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This paper presents and discusses the Life Cycle Impact Assessment of the Modified Chemical Vapor Deposition (MCVD) vitreous optical fiber production process.

Fiber optic cable deployment typically requires physical infrastructure changes, such as trenching and drilling, especially in areas where underground cables are needed. Although less...

Optical fiber is often perceived as “clean” because it supports efficient communication and reduces the need for energy-intensive data transport. However, the production stage involves ...

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